

**BP EXPLORATION****ARCO Alaska, Inc.**

July 17, 1997

Ms. Bonnie Thie  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, WA 98101

Re: Request for administrative revision to EPA PSD permits  
for Prudhoe Bay, Alaska facilities;  
Unit-specific ton per year emission limits for gas-fired equipment.  
ARCO Alaska Inc. and BP Exploration (Alaska), Inc.

Dear Ms. Thie:

ARCO Alaska Inc. (AAI) and BP Exploration (Alaska) Inc. (BPX) are responding to your letter of March 31, 1997 regarding our request to administratively revise four PSD permits issued jointly to AAI and SOHIO (subsequently purchased by BPX) between 1978 and 1981. These permits were issued for construction of new facilities at Prudhoe Bay, Alaska. The four permits are designated as follows by EPA: PSD-X79-05, PSD-X80-09, PSD-X81-01, and PSD-X81-13. These permits are referenced as PSD I, II, III, and IV respectively.

AAI and BPX have previously requested by letters of September 18, 1996, March 4, 1997, March 5, 1997, and March 14, 1997 administrative revisions to both short-term and ton per year emission limits. By letter of March 31, 1997 to AAI and BPX, EPA requested additional information in order to process our request. This correspondence is a response to your letter and fulfills your request for additional information. As mentioned in our previous correspondence, this request is being made to your office due to EPA's assertion that the Alaska Department of Environmental Conservation (ADEC) does not have authority to revise these permit conditions except in cases where new construction or modifications require ADEC to change existing EPA permit conditions. In this instance, there is no new construction or modification occurring. As always, we have copied ADEC on this request and intend shortly to request the same revisions to our ADEC permits in order for our initial Title V permits to be issued with minimum delay and confusion. We hope you can appreciate how cumbersome and resource intensive the revision process is in this case where there are two separate permits implemented by different agencies with conditions which apply to the same emission units.

### Background

Our prior requests referenced above asked that EPA 1) revise short-term emission limits for gas-fired equipment which are based on AP-42 emission factors and 2) remove the existing facility-wide and field-wide ton per emission limits. Your letter of March 31, 1997 indicated that EPA is willing to revise the short-term emission limits which are based on AP-42. However, you stated further that EPA would not agree to rescind the existing ton per year emission limits. Instead, you requested that AAI and BPX propose new unit-specific ton per emission limits. You also requested that a comparison be provided of the new emission limits with the existing ton per year limits. This letter fulfills your request and should allow the issuance of the requested revisions.

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Co-Operators, Prudhoe Bay Unit

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### Corrections to prior requests

Our prior request of March 4, 1997 asked for revisions to certain emission limits which were based on AP-42 emission factors. At the request of Ray Nye, this request was amended by an additional submittal on March 14, 1997 which converted all requested emission limits to the same units of lb/MMBtu. We have subsequently identified several revisions to those prior requests which we need to bring to your attention.

For certain large heaters (rated at greater than 43 MMBtu/hr), EPA based the BACT determination for NO<sub>x</sub> on the performance of low-NO<sub>x</sub> burners. However, the emission limits established for CO did not reflect the higher CO emission levels typically seen with low-NO<sub>x</sub> burner technology. Instead, EPA applied the same CO emission limit to all heaters regardless of size or the installation of low-NO<sub>x</sub> burners. We are requesting that EPA revise the current AP-42 based emission limit for CO of 0.018 lb/MMBtu for heaters with a capacity of greater than 43 MMBtu/hr to the current AP-42 value of 0.061 lb/MMBtu for heaters with low-NO<sub>x</sub> burners. In calculating the ton per year values in our request of today, we have used the 0.061 lb/MMBtu value where appropriate for large heaters with low-NO<sub>x</sub> burners.

We also previously requested a revision to the AP-42 based emission limits for particulate matter for both turbines and heaters. After reviewing again the current values in AP-42, we wish to withdraw this request. This will mean the current short-term emission limits under PSD II for particulate matter will remain in effect. In today's request, we used the current particulate matter emission limits in PSD II to calculate the proposed ton per year emission limits.

Our letter of March 14, 1997 also included a request that short-term emission limits once converted to the units of lb/MMBtu be adjusted further based on the current higher heating value of the fuel being burned at a given facility. We have since determined that technically the requested emission limits once converted to a lb/MMBtu basis should not be further corrected. Thus, we withdraw our request to reference or footnote the short-term emission limits in the manner previously suggested.

### Requested ton per year emission limits

Tables 1 through 4 contain our requested unit-specific ton per year emission limits. Each table contains currently installed equipment permitted under the specific EPA PSD permit identified.

The ton per year values have been calculated using either the current short-term emission limit or the requested revised emission limit, and assuming full operation throughout the year unless noted otherwise below. For heaters, the ton per year calculation is based on the maximum heat input in terms of MMBtu/hr. The ton per year calculation for turbines is based on heat inputs at full load operation and an ambient temperature of 0°.

In our previous requests, we did not seek to change technology-based short-term emission limits. These tables reflect the current NO<sub>x</sub> emission limits for all turbines and heaters rated at greater than 43 MMBtu/hr. All other short-term values used in the ton per year calculations are from the current edition of AP-42 and are contained within our prior revision request unless otherwise described below.

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One exception is the short-term emission limit for CO for the GE turbine at the AAI CCP listed in Table 2. Under PSD II, the current EPA permit limit for this unit is 109 lb/MMscf. However, ADEC has imposed a more stringent limit of 50 lb/MMscf CO (converted to 0.05 lb/MMBtu in Table II) through the state permit process. The calculated ton per year value in Table II is based on the more stringent ADEC emission limit. In this case, we request the EPA short-term emission limit for this unit be rescinded. An additional exception for this unit involves the NO<sub>x</sub> emission limit. EPA established a NO<sub>x</sub> emission limit of 150 (14.4/Y) ppm. ADEC has subsequently deleted the correction factor from the limit, and we have based our calculation on the new limit of 150 ppm.

An additional exception is within Table 4 of our request. Under PSD IV, EPA established a BACT limit of 20 ppm H<sub>2</sub>S in fuel. Through the state permit process, ADEC has revised this limit to either 25 or 30 ppm for all units subject to PSD IV. In calculating the proposed ton per year limits in Table 4, we have used the revised limits approved by ADEC. We are requesting EPA recognize the 20 ppm BACT limit under PSD IV for these units no longer applies and rescind the limit.

A final exception is shown in Table 3 for the BP GC1\SIPW facility. The two Econotherm heaters were permitted under PSD III and have a CO emission limit of 0.018 lb/MMBtu. These heaters are auxiliary-fired waste heat recovery units with two modes of operation: a fresh air firing mode and normal operation when the associated turbines are in operation. In order to address the fresh air firing mode, ADEC established a revised emission limit of 60 ppm CO for this type of operation. ADEC also imposed a restriction on hours of operation on these heaters and other turbines in order to avoid an emissions increase. The 60 ppm CO emission limit and hourly restrictions imposed by ADEC have been used to calculate the requested ton per year emission limit in Table 3. We are requesting a single ton per year limit for the two units because ADEC has established an hourly restriction which applies to the units as a group. Likewise, we are proposing a single ton per year limit for the three Ruston turbines permitted under PSD III at the BP GC1\SIPW facility because ADEC has established an hourly restriction here as well which applies to the turbines as a group.

#### Comparison of existing and proposed ton per year emission limits

In response to the Region's request, Table 5 contains a comparison of existing and requested ton per year emission limits. For ease of comparison, ton per year values have been summed for each pollutant under each of the four PSD permits. None of the EPA PSD permits contained unit-specific emission limits. PSD I contained a single ton per year emission limit for NO<sub>x</sub> with the units of ton/year/hp. The derivation of this limit is not explained in EPA's preliminary determination, and we are proposing to replace it with a unit-specific ton per year limit. PSD II and III contain facility-wide ton per year emission limits for turbines and heaters. PSD IV contains ton per year limits for turbines and heaters which apply to the entire Prudhoe Bay field without identification of specific facilities.

As shown in Table 5, the sum of our requested unit-specific ton per year emission limits are considerably lower than the current allowable ton per year emission limits in the EPA permits. This result should provide further reason for the Region to approve our request for an administrative revision to PSD permits I, II, III, and IV. We note that twice Region 10 has granted revisions to the EPA PSD permit for Alyeska Pipeline Service Company which contained increases in the existing ton per year emission limits by an administrative revision. In each case, the increase

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was due to better emissions information and not due to new construction or modification of existing equipment. Our request is similar in nature but provides for an overall decrease in allowable ton per year emissions on a comparative basis.

### Conclusion

This correspondence addresses in full your request for additional information on March 31, 1997 in order to approve our request for administrative revision to the four EPA PSD permits issued to AAI and BPX Prudhoe Bay facilities. As requested, we have proposed new unit-specific ton per year emission limits which are to replace the current ton per year emission limits. Additionally, we have compared the requested ton per values with the existing permit limits and shown that if granted as requested, there will be a decrease in allowable emissions.

We urge you to now issue the requested revision of March 4, 1997 (amended by subsequent submission of March 14, 1997) to existing short-term emission limits and the revision to existing ton per year emission limits contained in this correspondence. If there are any questions regarding our request, please contact Randy Potect at (907) 263-4741 or Alison Cooke at (907) 564-4838.

Sincerely,



Randy Potect  
Environmental Consultant  
ARCO Alaska Inc.



Alison Cooke  
Environmental Engineer  
BP Exploration (Alaska) Inc.

Attachments: 5 tables

cc: Jim Baumgartner, ADEC  
Ron Chaitoff, ADEC  
Bob Hughes, ADEC  
Ray Nye, Region 10

**TABLE 1**  
**REQUESTED EPA TON PER YEAR EMISSION LIMITS FOR**  
**PSD I**

LOCATION	EQUIP TAG #	MFG/MODEL #	ISO HP RATING (HP)	0° F HRR (MMBtu/hr)	NO <sub>x</sub>		
					EMISSION LIMIT	EF (lb/MMBtu)	EMISSIONS tons/yr
GC#2	GTRB-02-7000	GE/MS5352B	35,000	360.603	173 ppmv	0.706	1,115
GC#2	GTRB-02-7001	GE/MS5352B	35,000	360.603	173 ppmv	0.706	1,115

**REQUESTED EPA TON PER YEAR EMISSION LIMITS FOR  
PSD II**

LOCATION	EQUIP TAG #	MFG/MODEL#	SHP RATING (HP)	° F HRR (MMBtu/hr)	NO <sub>x</sub>			CO		PM	
					EMISSION LIMIT	CR	EMISSIONS	EMISSION LIMIT	EMISSIONS	EMISSION LIMIT	EMISSIONS
						(lb/MMBtu)	tons/yr		tons/yr		tons/yr
GC#1	NGT-7000	GE/MS5352B	35,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
GC#1	NGT-7001	GE/MS5352B	35,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
GC#1	NGT-3204	RR/RB211-24C <i>Rolls Royce</i>	33,300	258.75	216 ppmv	0.88	999.3	0.17 lb/MMBtu	192.7	0.014 lb/MMBtu	15.9
							3,230.0		729.7		60.1
GC#2	GTRB-02-7529	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	2.0
GC#2	GTRB-02-7504A	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0	0.014 lb/MMBtu	2.0
GC#2	GTRB-02-7504B	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0	0.014 lb/MMBtu	2.0
GC#2	GTRB-02-7704A**	Sulzer/	8,420	75.60	170 ppmv	0.69	229.8	0.17 lb/MMBtu	56.3	0.014 lb/MMBtu	4.6
							543.4		142.6		8.6
GC#2	B-02-7000	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#2	B-02-7001	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#2	B-02-7002	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
							61.6		15.4		4.8
GC#3	GTRB-03-7000	GE/MS5352B	35,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
GC#3	GTRB-03-7001	GE/MS5352B	35,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
GC#3	GTRB-03-7704A	Sulzer/	8,420	75.60	170 ppmv	0.69	229.8	0.17 lb/MMBtu	56.3	0.014 lb/MMBtu	4.6
							2,460.5		593.3		48.9
GC#3	B-03-7000	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#3	B-03-7001	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#3	B-03-7002	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#3	B-03-7003	CB/200800	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
GC#3	B-03-7004	CB/200800 <i>Class F fuel</i>	N/A	33.50		0.14	20.5	0.035 lb/MMBtu	5.1	0.011 lb/MMBtu	1.6
							102.7		25.7		8.1
OCP	NGT-18-1813	GE/MS5371PATP	35,400	357.12	150 ppmv	0.61	957.7	0.05 lb/MMBtu	78.2	0.014 lb/MMBtu	21.9
FS#1	15-1803	GE/MS5352B	36,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	15-1804	GE/MS5352B	36,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	15-15107	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	3.2
							2,371.7		575.4		47.4
FS#2	16-1803	GE/MS5352B	36,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	16-1804	GE/MS5352B	36,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	16-15105	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	3.2
	16-15108	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	3.2
							2,512.6		613.7		50.5

**TABLE 2**  
**REQUESTED EPA TON PER YEAR EMISSION LIMITS FOR**  
**PSD II**

LOCATION	EQUIP TAG #	MFG/MODEL#	ISO HP RATING (HP)	0° F FHR (MMBtu/hr)	NO <sub>x</sub>			CO		PM	
					EMISSION LIMIT	EF	EMISSIONS	EMISSION LIMIT	EMISSIONS	EMISSION LIMIT	EMISSIONS
						(lb/MMBtu)	tons/yr		tons/yr		tons/yr
FS#3	14-1803	GE/MS5352B	36,000	360.80	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	14-1804	GE/MS5352B	36,000	360.60	173 ppmv	0.71	1,115.4	0.17 lb/MMBtu	268.5	0.014 lb/MMBtu	22.1
	14-1806	GE/MS5322R	32,000	262.96	216 ppmv	0.88	1,015.5	0.17 lb/MMBtu	195.8	0.014 lb/MMBtu	16.3
	14-15105	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	3.2
	14-15106	Ruston/TB5000	4,900	51.51	153 ppmv	0.62	140.9	0.17 lb/MMBtu	38.4	0.014 lb/MMBtu	3.2
							3,528.1		909.5		66.7

\*\* Mfg only supplied a single data point to estimate the emissions.

**REQUESTED EPA TON PER YEAR EMISSION LIMITS FOR  
PSD III**

LOCATION	EQUIP TAG #	MFG/MODEL#	ISO HP RATING (HP)	0° F HFR (MMBtu/hr)	NO <sub>x</sub>			CO	
					EMISSION LIMIT	BR (lb/MMBtu)	EMISSIONS tons/yr	EMISSION LIMIT	EMISSIONS tons/yr
SPE	NGT-31-15101	RR/RB211-24A	29,070	239.11	207 ppmv	0.84	884.9	0.17 lb/MMBtu	178.0
SPE	NGT-31-15102	RR/RB211-24A	29,070	239.11	207 ppmv	0.84	884.9	0.17 lb/MMBtu	178.0
SPE	NGT-31-15301	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0
SPE	NGT-31-15302	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0
SPE	NGT-31-15303	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0
SPE	NGT-31-15304	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	86.4	0.17 lb/MMBtu	24.0
							2,115.3		452.0
SPE	NGH-31-1401	Broach	N/A	67.20		0.08	23.5	0.061 lb/MMBtu	18.0
SPE	NGH-31-1402	Broach	N/A	67.20		0.08	23.5	0.061 lb/MMBtu	18.0
							47.1		35.9
GC#1\SIPW	GTRB-51-8002A	RR/RB211-24A	29,070	239.11	207 ppmv	0.84	282.9	0.17 lb/MMBtu	56.9
GC#1\SIPW	GTRB-51-8002B	RR/RB211-24A	29,070	239.11	207 ppmv	0.84	282.9	0.17 lb/MMBtu	56.9
GC#1\SIPW	GTRB-51-8001A	Ruston/TA2500	2,500	32.20	150 ppmv	0.61		0.17 lb/MMBtu	
GC#1\SIPW	GTRB-51-8001B	Ruston/TA2500	2,500	32.20	150 ppmv	0.61		0.17 lb/MMBtu	
GC#1\SIPW	GTRB-51-8001C	Ruston/TA2500	2,500	32.20	150 ppmv	0.61	55.2	0.17 lb/MMBtu	15.3
							620.9		129.1
GC#1\SIP	H-51-8002A	Econotherm	N/A	320.00		0.08		60 ppmv	
GC#1\SIP	H-51-8002B	Econotherm	N/A	320.00		0.08	71.7	60 ppmv	204.3
							71.7		204.3

TABLE 4  
REQUESTED EPA TON PER YEAR EMISSION LIMITS FOR  
PSD IV

LOCATION	EQUIP TAG #	NFGM CODE #	ISO HP RATING (HP)	° F HRR (MMBtu/hr)	NO <sub>x</sub>			CO		SO <sub>2</sub>		PM	
					EMISSION LIMIT	PPH (lb/MMBtu)	EMISSIONS tons/yr	EMISSION UNIT	EMISSIONS tons/yr	EMISSION LIMIT (lb fuel)	EMISSIONS tons/yr	EMISSION LIMIT	EMISSIONS tons/yr
GC#1SIFW	GTRB-51-3304	FR/FB211-24C	33,300	258.75	215 ppmv	0.882	999.3	0.17 lb/MMBtu	192.7	25 ppmv	5.0	0.014 lb/MMBtu	15.9
	GTRB-01-7704A	Sulzer/S3**	8,400	75.40	170 ppmv	0.894	229.2	0.17 lb/MMBtu	56.1	25 ppmv	1.5	0.014 lb/MMBtu	4.8
	GTRB-01-7704B	Sulzer/S3**	8,400	75.40	170 ppmv	0.894	229.2	0.17 lb/MMBtu	56.1	25 ppmv	1.5	0.014 lb/MMBtu	4.8
GC#2	GTRB-W-3152	Sulzer/Mars	12,600	113.00	198 ppmv	0.808	401.0	0.17 lb/MMBtu	34.1	25 ppmv	2.2	0.014 lb/MMBtu	5.2
	GTRB-02-7704B	Sulzer/S3**	8,420	75.40	170 ppmv	0.894	229.2	0.17 lb/MMBtu	56.1	25 ppmv	1.5	0.014 lb/MMBtu	1.5
GC#3	GTRB-03-7704B	Sulzer/S3**	8,400	75.40	170 ppmv	0.894	229.2	0.17 lb/MMBtu	56.1	25 ppmv	1.5	0.014 lb/MMBtu	4.8
FS#2	NGT-14-15133	Ruelson/TB5000	4,900	51.51	153 ppmv	0.625	140.9	0.17 lb/MMBtu	38.4	30 ppmv	1.0	0.014 lb/MMBtu	3.2
FS#3	14-15188	Ruelson/TB5000	4,900	51.51	153 ppmv	0.625	140.9	0.17 lb/MMBtu	38.4	30 ppmv	1.1	0.014 lb/MMBtu	3.2
	14-15189	Ruelson/TB5000	4,900	51.51	153 ppmv	0.625	140.9	0.17 lb/MMBtu	38.4	30 ppmv	1.1	0.014 lb/MMBtu	3.2
							2,738.7		618.4		18.1		50.8

\*\* Nit only supplied a single data point to estimate the emissions.

**Table 5**  
**Comparison of Existing and Requested Ton Per Year Permit Limits**

<u>EPA Permit No.</u>	<u>Existing Permit Limit<sup>1</sup></u>	<u>Requested Permit Limit<sup>2</sup></u>
PSD-X79-05 "PSD I"	0.019 ton/year/hp NO <sub>x</sub> 6,797 tons NO <sub>x</sub> (estimate) <sup>3</sup>	2,233 tons NO <sub>x</sub>
PSD-X80-09 "PSD II" <sup>5</sup>	22,357 tons NO <sub>x</sub> <sup>4</sup> 4,181 tons CO <sup>4</sup> 592 tons PM <sup>4</sup>	15,769 tons NO <sub>x</sub> 3,584 tons CO 317 tons PM
PSD-X81-01 "PSD III" <sup>5</sup>	7,334 tons NO <sub>x</sub> <sup>4</sup> 1,240 tons CO <sup>4</sup>	2,855 tons NO <sub>x</sub> 821.3 tons CO
PSD-X81-13 "PSD IV" <sup>5</sup>	8,305 tons NO <sub>x</sub> 1,481 tons CO 52 tons SO <sub>2</sub> 210 tons PM	2,739 tons NO <sub>x</sub> 616 tons CO 16 tons SO <sub>2</sub> 51 tons PM

<sup>1</sup>Emission limits in PSD II and III were established on a facility-wide basis for turbines and heaters. Values in this column are totals of the facility-wide limits for both turbines and heaters.

<sup>2</sup>Requested emission limits are on a unit-specific basis. Values have been totaled in this column for comparative purposes.

<sup>3</sup>The only ton per year emission limit in the PSD I permit is 0.019 ton/yr/hp. For comparative purposes, this value comes from Table 1 of the 1979 EPA Preliminary Determination which shows projected emission rates for the permitted sources.

<sup>4</sup>These values reflect the emission limits which were formally amended by EPA letter of May 7, 1981.

<sup>5</sup>Under the EPA administrative approval of 1/10/84 (referred to as SWAP IV), no adjustment to ton per emission limits in PSD II, III, or IV was made or were ton per year emission limits established for new equipment.